NURESAFE WP1.3
BWR ATWS WITH UNCERTAINTY QUANTIFICATION

Status of KIT contribution

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Outline

- Coupling scripts in the svn repository
- New INTERP damping function tested.
- Preliminary coupled results.
- Conclusion & Outlook

Coupling scripts in the svn repository

Coupling scripts in the svn repository

- Several coupling scripts have been added in the svn repository as well as the corresponding input decks.
- They are going to be use to complete the calculations.

ATHLET_COBRA-TF (GRS)	**DYN3D_COBRA-TF (GRS-KIT)**
ATHLET_DYN3D (GRS)	**DYN3D_SCF (KIT)**

- Some tests cases with simplified geometry were added:
  - recmini25_hfp, recmini25_hzp, hexmini7_hfp
- The input decks for O2 are still not uploaded to due doubts in possible conflicts with the non-disclosure agreement.

New INTERP damping function

New INTERP damping function

- The new applyDamp method in INTERP2_5D has been implemented in several coupling schemes.
- The idea is to damp the feedback coupling iterations between N-TH codes to speed up convergence in Steady State.
- Specially needed for BWR problems where TH feedback is very strong.

$$T = factor * Tnew + (1-factor) * Told$$
$$factor = \sim 0.7$$

- User input option in the python scripts has been added: do_damping=1
- Tested between DYN3D-SCF; CRONOS-SCF; DYN3D-FLICA4 and DYN3D-CTF

Preliminary DYN3D-CTF and DYN3D-SCF results for the HFP SS

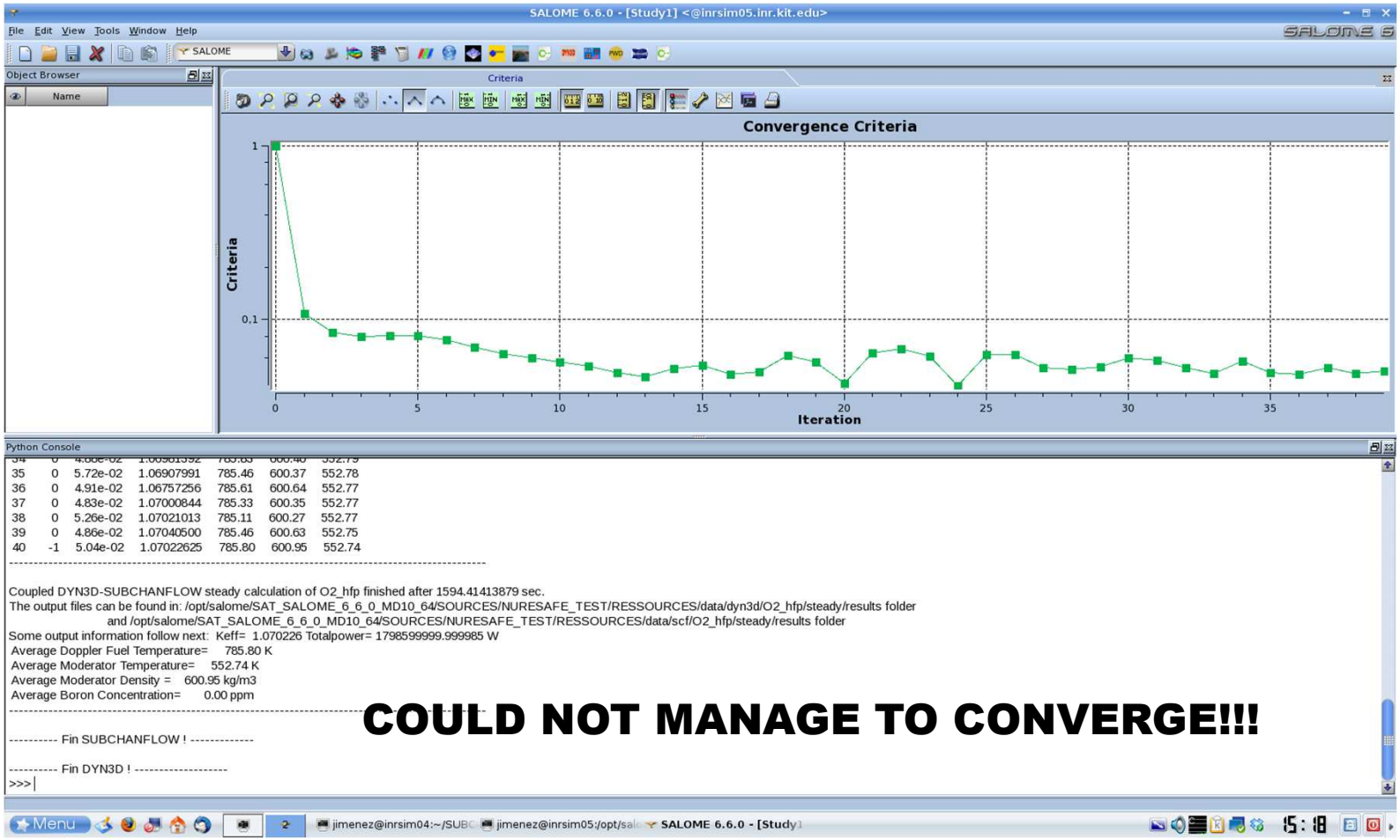
Preliminary results DYN3D_COBRA-TF

- Using the latest NEMTAB library delivered in December 2014 by PSU.
- Coupling scripts in the svn repository under SAT/TEST/DYN3D_CTF/.
- Note: The COBRA-TF component can not be compiled in MDV2010.2, too old native gfortran. MAGEIA 4 was used instead with SALOME 6.6.0 (gfortran 4.8.2).

- Kostadin Ivanov promised a new library on 16.2.2015, not yet received.

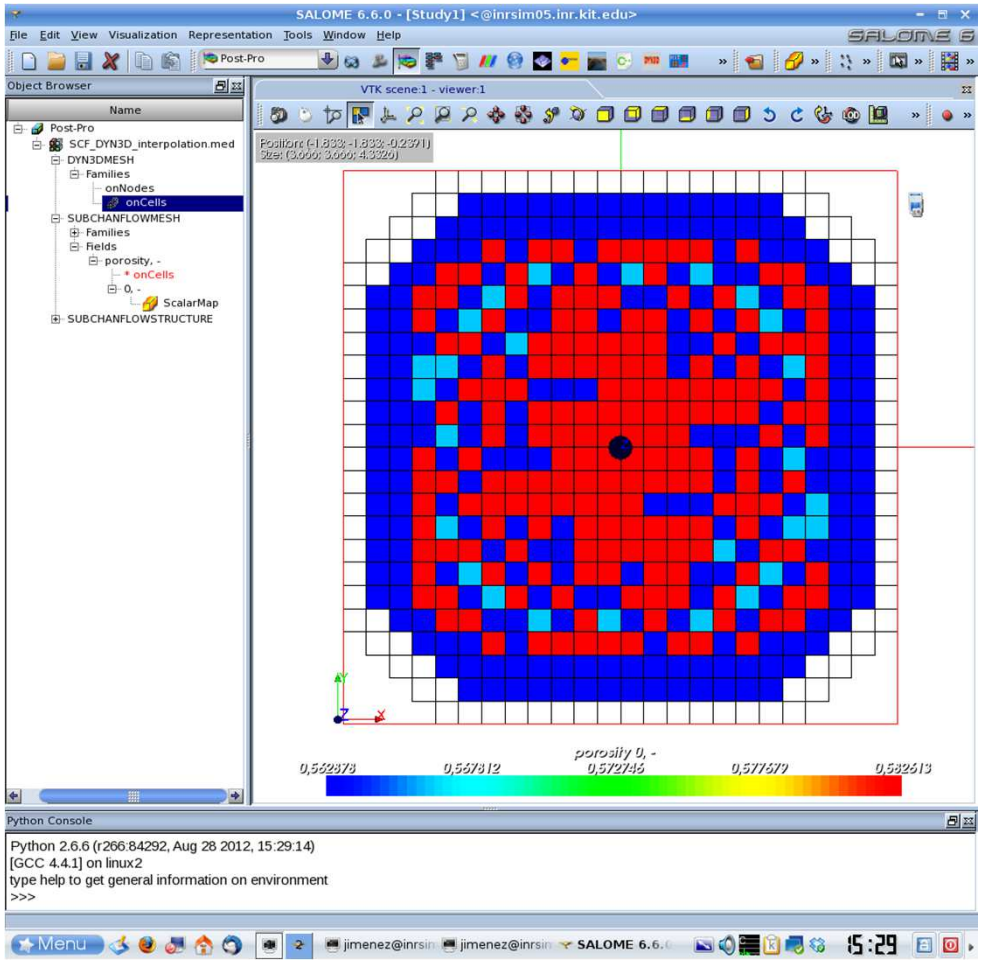
Preliminary results DYN3D_SCF

- Coupling scripts in the svn repository under SAT/TEST/DYN3D_SCF/



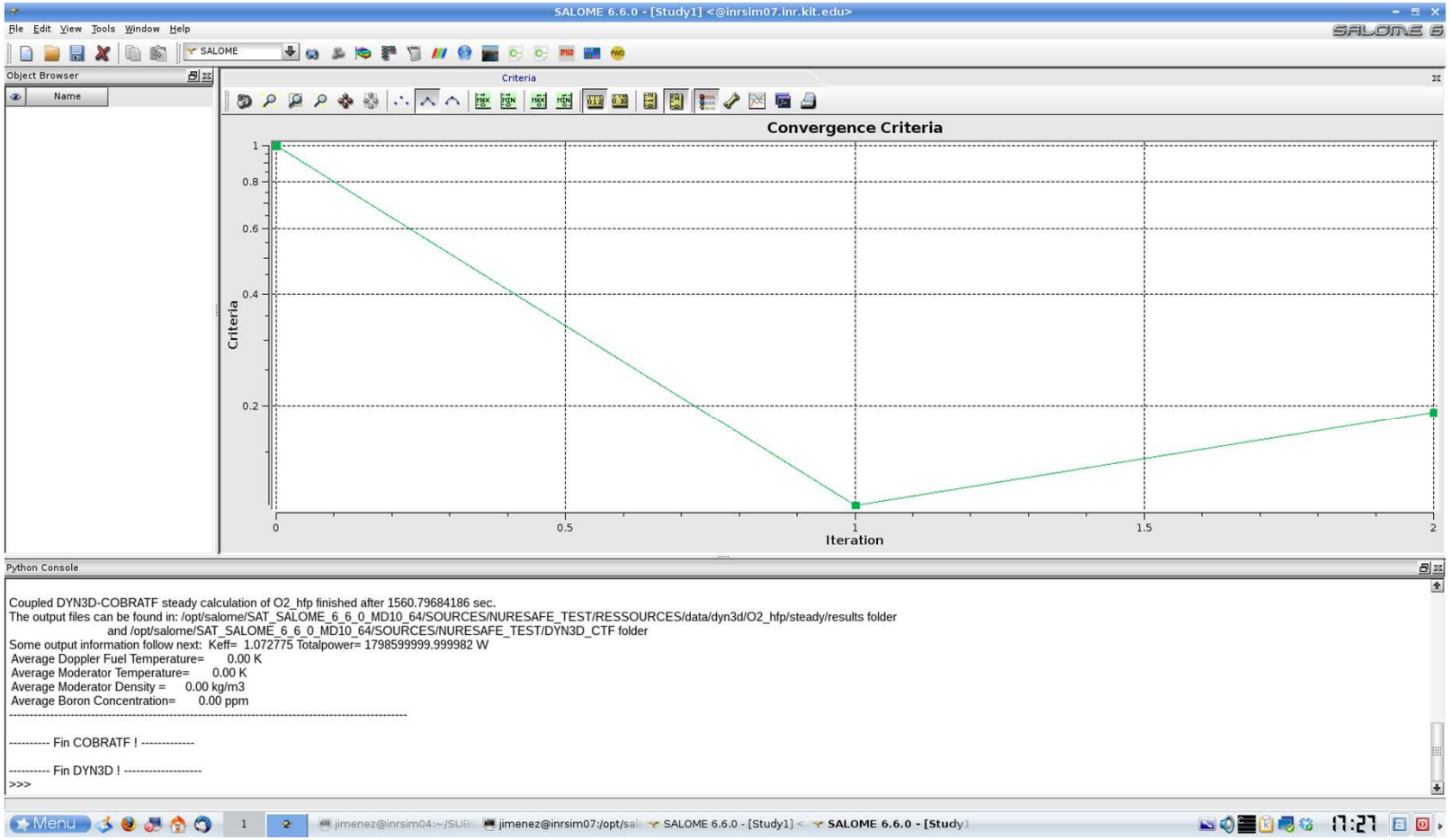
Preliminary results DYN3D_SCF

- **Coupling scripts in the svn repository.**



Preliminary results DYN3D_COBRA-TF

- First coupled iteration, It seems that the data is not transferred fine and there is only two N-TH iterations



Preliminary results DYN3D_COBRA-TF

- The obtained results still have not physical meaning.
- Keff should be close to 1.000 as it is a real HFP plant condition.
- The DYN3D_SCF values are from a not converged calculation.
- The DYN3D_COBRA-TF results are very preliminary as it seems that no real feedback is exchanged. Flat densities and temperatures fields.

	DYN3D-SCF	DYN3D-CTF
Keff	1.07022~1.06757	1.07277
Av. TDOP	785.80 K	-
Av. DMOD	600.95 kg/m^3	-
Av. TMOD	552.74 K	-

Conclusions and Outlook

- **The coupling scripts have been updated.**
  - Now all the coupling scripts to perform the simulations are available.
- **Successful testing of the new function implemented in INTERP**
- **First coupled results, still need to be improved.**

FUTURE WORK

- **In the next months:**
  - Waiting for a proper set of XS libraries for the O2 (KTH/PSU?).

THANKS FOR YOUR ATTENTION